Information System Project Evaluation

IS Project evaluation: it involves deciding whether or not to go ahead with a project.

It is a case of comparing a proposed project with the alternatives and deciding whether to proceed with it.
The evaluation is based on strategic, technical and economic criteria.
The risks involved are also evaluated.

NB All projects are feasible given unlimited resources and infinite time.

Unfortunately, most projects must be developed within tight budgetary and time constraints.

Feasibility Analysis

Feasibility: It is a measure of how beneficial or practical the development of a system will be to an organization.

Feasibility Analysis: It is the process which feasibility is measured.

In every organization there needs to be a strategic plan that clearly defines the organizations objectives.

This provides the context for defining the goals of the project and for assessing the individual projects.

Feasibility Tests / Factors

The following are categories of feasibility factors. They are also referred to as feasibility tests:

i. **Economic Feasibility -** this is a measure of the cost-effectiveness of the project or solution. It is often called *cost-benefit analysis. It deals with costs and benefits of the system.*

ii. **Technical Feasibility -** this a measure of the practicality of a specified technical solution and the availability of technical resources and expertise. Technical feasibility criteria measures the worthiness of a project or solution. It is computer oriented.

iii. Operational Feasibility -this is a measure of how well the solution will work in the organization. It is also a measure of how people feel about the project/system. It is also a feasibility criteria that measures the worthiness of a project or solution. It is people oriented.
iv. Schedule Feasibility - this is a measure of how reasonable the project timetable is.
v. Legal and Contractual Feasibility- legal ramifications
vi. Political Feasibility- political implication in the organization

Together, the culmination of the feasibility analyses form the business case that justifies the expenditure of resources on the project.

Assessing Economic Feasibility:

The purpose of assessing economic feasibility is identify the financial benefits and costs associated with the development project. Often referred to as cost-benefit analysis.

This activity deals with determining how to estimate costs and benefits, comparison of those costs and benefits to determine which ones are feasible.

Determining Project Benefits

A system can provide many benefits to an organization, e.g. an information system can automate monotonous jobs, thus reducing errors, providing innovative services to customers and suppliers and improving organizational efficiency, speed, flexibility, and morale.

Benefits can be viewed as being both tangible and intangible.

Tangible Benefits- refer to items that can be measured in monetary terms and with certainty. They are easily quantifiable.

Intangible Benefits- refer to items that cannot be measured in monetary terms or with certainty. They are believed to be difficult to quantify.

Tangible benefits include: reduced personnel expenses, lower transactional costs, or higher profit margins.

Most tangible benefits will fit in the following categories.

Cost reduction and avoidance
Fewer processing errors.
Increased flexibility.
Elimination of job steps.
Increased throughput and reduced response time.
Improved of management planning and control.
Opening new markets and increasing sales opportunities.

NB: Not all tangible benefits can easily be quantified, e.g. a tangible benefit that allows a company to perform a task in 50% of the time may be difficult to quantify in terms of hard shillings/dollars savings.

Intangible Benefits

Intangible benefits may have direct organizational benefits such as the improvement of employee morale or they may boarder societal implications such the reduction of waste creation or resource consumption.

In brief they include:

Increased customers goodwill.
Improved employee morale.
Better service to the community.
Better decision making.

Determining Project Costs

Costs fall into two categories: tangible costs and intangible costs.

Tangible Costs- refer to items that can easily be measured in monetary terms and with certainty.

Intangible Costs- are those items that cannot easily be measured in monetary terms or with certainty.

Besides tangible and intangible costs we can distinguish other project related costs; this can be classified as either **Fixed (one-time)** or **Variable (recurring) costs.**

Tangible Costs

From the project development perspective, tangible costs include items such as

-Hardware costs- costs of new computer equipment.
-Labor costs- salaries of the systems analysts, programmers, consultants data entry personnel, computer operators, secretaries etc.
-Operational costs such as employee training- when computer personnel and project team member have to be trained.
-Building renovations.
-Supply, duplication, and equipment costs.

Intangible Costs

Intangible costs include
The loss of customer goodwill,
The loss of employee morale,
Decreased operational efficiency.

Fixed (one-time) costs

Fixed costs refer to those costs associated with project initiation and development and the start-up of the system.

These cost typically encompass activities such as system development, new hardware and software purchases, user training site preparation, and data or system conversion.

When conducting an economic cost-benefit analysis, a worksheet should be created for capturing these expenses.

Variable (recurring) costs

Variable cost occur in proportion to some usage factor. They refer to those costs resulting from the ongoing evolution and use of the system.

Examples of these costs include:
-Application software maintenance.
-Incremental data storage expenses.
-Incremental communications.
-Supplies e.g. preprinted forms, printed paper, removable media etc.
-Prorated overhead costs, e.g. utilities, maintenance, telephone services etc.
-New hardware and software leases.

Cash flow forecasting

A cash flow forecast will indicate when expenditure and income will take place.

The difficulty and importance of cash flow forecasting is evidenced by the number of companies that suffer bankruptcy because, although they are developing profitable products or services, they cannot sustain an unplanned negative cash flow.

Accurate cash flow is not an easy task. It generally needs to be done early in the project's lifecycle (at least before any significant expenditure is committed) and many items to be estimated (particularly the benefits of using software or decommissioning costs) might be some years in the future.

Cost-benefit evaluation techniques

We would consider proceeding with a project only where the benefits outweigh the costs.
However in order to choose among projects , we need to take in account the timing of the costs and benefits as well as the benefits relative to the size of the investment.

There are three popular techniques for assessing economic feasibility of a project. The project manger should have a thorough knowledge of these techniques.

The Payback Analysis.
Return on Investment
Net Present Value.

Time Value of Money

All the three techniques used to determine economic feasibility encompass the concept of the ***Time Value Of Money* (TVM).**

TVM refers to the concept of comparing present cash outlays to the future expected returns- i.e. a shilling/dollar today is worth more than a shilling/dollar one year from now.

One can invest a shilling today and through accrued interest, have more than one shilling a year from now.

Example

Suppose you want a to buy a car from an acquaintance and she asks that you make three payments of $1,500 for three years, beginning next year, for a total of $4,500. if she would agree to a single lump sum payment at the time of sale (and you had the money) what amount do you think you would agree to?

To answer this question, we must consider the time value for money.
Most of us would gladly accept $4,500 today rather than three payments of $1,500, because a dollar today (or $4,500) is worth more than a dollar tomorrow since money can be invested.

The rate at which money can be borrowed or invested is called the ***cost of capital***, and is called the ***discount rate*** for TVM calculation.

Suppose that the seller could put the money received from the sale of the car in the bank and receive a discount of 10% return on her investment.

A simple formula can be used to when figuring out the **present value** of the three $1,500 payments.

$PV_n = Y [1/(1+i)^n]$, where PV_n is the present value of Y dollars n years from now when i is the discount rate.

From the example, the present value of the three payments of $1,500 can be calculated as follows:

$PV_1 = 1500\ [\ 1/(1+0.10)^1] = 1500*0.9091 = 1363.65$
$PV_2 = 1500\ [\ 1/(1+0.10)^2] = 1500*0.8264 = 1239.60$
$PV_3 = 1500\ [\ 1/(1+0.10)^3] = 1500*0.7513 = 1126.95$

Where PV_1, PV_2, PV_3 , reflect the present value of each $1,500 payment in year one two and three respectively

THE NET PRESENT VALUE (NPV)

The **Net Present Value (NPV)** is a project evaluation technique that takes into account the profitability of a project and the timing of the cash flows that are produced.
It does so by discounting future cash flows by a percentage known as the discount rate (discussed previously).
To calculate the net present value (NPV) of the three $1,500 payments, simply add the present values calculated previously.
NPV = PV_1 + PV_1+ PV_1= 1363.65 + 1239.60 + 1126.95=3730.20
In other words, the seller could accept a lump sum payment of $3,730.20 as equivalent to the three payments of $1,500, given a discount rate of 10%.

THE NET PRESENT VALUE (NPV)

After establishing the relationship between time and money, the next step in performing the economic feasibility is to create a summary worksheet reflecting the present values of all the benefits and costs as well as all permanent analyses.

After discounting all costs and benefits, subtract the sum of the discounted costs from the sum of all discounted benefits to determine the Net Present Value .

If the NPV is positive, the investment is good. If negative, the investment is bad.

When comparing multiple projects, the one with the highest NPV is the best investment.

Payback Analysis

It is a simple and popular method for determining if and when an investment will pay for itself.

The payback period- It is the time taken to break even or pay back the initial investment.

Since the system development costs are incurred long before the benefits begin to accrue, it will take some time before the benefits overtake the costs.

After implementation, other operational costs/expenses continue to be incurred.

Therefore the pay back analysis determines how much time will elapse before accrued benefits overtake accrued and continuing cost.

The break-even point- This is the point at which the projects benefits equals the costs.

Payback Analysis

Normally the project with the shortest payback period will be chosen on the basis that an organization will wish to minimize the time it is debt.

The following system will be developed at a cost of $418,040. The estimated net operating costs for each of the next six years are also recorded in the table . The estimated net benefits over the same six operating years are also shown. What is the pay back period? See attached figure.

The advantage of the payback period is that it is simple to calculate and it is not particularly sensitive to small forecasting to small forecasting errors.

Its disadvantage is that it ignores the overall profitability of the project- in fact it totally ignores any income (or expenditure) once the project has broken even.

Return om Investment (ROI)

The **Return On Investment** analysis techniques compares the lifetime profitability of alternative solutions or projects.
The ROI for a solution or project is a percentage rate that measures the relationship between the amount of business gets back from the investment and the amount invested.
The lifetime ROI for a potential solution or project is calculated as follows:
Lifetime ROI = (Estimated Lifetime Benefits-estimated Lifetime Costs) / Estimated Lifetime Costs
Use the client server system project to calculate the ROI. See attached figure.
Lifetime ROI = ($795,440-$488,692) / $488,692=0.628=63%

Operational Feasibility

Operational Feasibility: This is a criteria that measures the urgency of the problem or the acceptability of a project. It involves the examining the likelihood that the project will attain its desired objectives.

Its purpose is to gain an understanding of the degree to which the proposed system will likely solve the business problems or take advantage of the opportunity identified in the project identification

There two aspects of operational feasibility to be considered.
Is the project worth undertaking?
How does the end-users and management feel about the project?

Operational Feasibility

The assessment of operational feasibility should include an analysis of the worthiness of the proposed system as following:

Performance-will the system provide adequate throughput and response time?

Information- does the system provide the end-users and mangers with timely, pertinent, accurate, and useful formatted information?

Economy- does the system offer adequate service level and capacity to reduce costs of the business and increase the profits of the business?

Control- does the system provide adequate controls to protect against fraud and embezzlement and to guarantee the accuracy and security of data and information?

Efficiency- does the system make maximum use of available resources including people, time, flow of forms, minimum processing delays, etc.

Services- does the system provide desirable and reliable service to those who need it? Is the system flexible and expandable?

Operational Feasibility

The assessment of operational feasibility should include an analysis of how the end users feel about the proposed system.

A workable solution can fail because of end users and management resistance. Thus the following questions need to be answered:

Does the management support the system?

How do the end users feel about their role in the new system?

What end-users and mangers may resist or not use the system?

NB people tend to resist change.

How will the working environment of the end-users change?

Can or will end-users and management adapt to the change.

NB: **Usability analysis:** it is performed when determining operational feasibility. This is a test of the systems user interfaces. Measures of usability include: **ease of learning, ease of use, and user satisfaction.**

Technical Feasibility

The purpose of **Technical Feasibility** is to gain an understanding of the organization's ability to construct the system.
It looks at what is practical and reasonable. It should address three major issues:
Is the proposed technology or solution practical?
Does the organization possess the necessary technology?-
Does the organization possess the necessary technical expertise?

NB: Technical feasibility should include an analysis of the technical risks involved.

Schedule Feasibility

Schedule Feasibility is concerned with the project duration.
It answers the question "are the projects deadline reasonable?"
It helps to gain an understanding of the likelihood that all potential time frames and completion dates schedules can be met and that meeting these dates will be sufficient for dealing with the needs of the organization.

It is important to determine whether deadlines are mandatory or desirable. Penalties associates with failing to meet may make it mandatory. If the deadlines are desirable then the project manger may propose alternative schedules.

It is preferable (unless the deadline is absolutely mandatory) to deliver a properly functioning system two months late than to deliver an error-prone useless system on time.
Missed schedules are bad!, but inadequate systems are worse!

Legal and Contractual Feasibility

Legal And Contractual Feasibility is important criteria used to gain an understanding of the potential legal ramifications due to the construction of the system.
Possible considerations might include:
Copyright or nondisclosure infringements.
Labour laws.
Antitrust legislation (which limit the creation of systems to share data with other organizations).
Privacy, access and security.
Financial reporting standards.
Contractual obligations might include:
-Ownership of software.
-Licensing agreements.
-Non-disclosure agreements with partners.
-Elements of labour agreements.

Political Feasibility

Political Feasibility - It attempts to gain an understanding of how key stakeholders within the organization view the proposed system.

The development of a system have political ramifications, e.g. since the system may affect the distribution of information within an organization and thus the distribution of power.

The stakeholders not supporting the system may block disrupt or change the intended focus of the intended project.

q

MIS Planning – Integrating IS and Business Strategies

IS planning is a set of activities directed toward achieving three objectives:

Recognizing **organizational opportunities and problems** where IS might be applied successfully;

Identifying the **resources needed to allow IS to be applied successfully** to these opportunities and problems; and

Developing strategies and procedures to allow IS to be applied successfully to these opportunities and problems

The opportunities can be classified into four:

To gain **competitive advantage**.

To **improve productivity and performance**.

To **enable new ways of managing and organizing**.

To **develop new businesses.**

Business Planning and IS Planning

Information Systems Planning is an important activity for helping organization **to identify strategic applications** and to **align an organization's strategy** with effective information systems to achieve organization's objectives

Information systems planning should be an integral part of business planning

Business planning – the process of identifying the firm's goals, objectives and priorities and developing action plans for accomplishing them.

Information systems planning – the part of business planning concerned with developing the firm's information systems resources

It is essential to **shift the focus** of IT infrastructure planning **from automation** of operations **to the thrust of business.**

Organizational Change enabled by IT/ISs

- **Automation**: Speeding up performance
- **Rationalization of procedures**: Streamlining of operating procedures
- **Business Process Reengineering**: Radical design of business processes
- **Paradigm shift**: Radical reconceptualization

FRAMEWORK for Integrating IS/IT STRATEGY with BUSINESS STRATEGY

Effective strategic IS planning can help organizations use IT to reach business goals.

It can also enable organizations to use IT to significantly impact their strategies.

The essential requirement for effective IS planning is that the needs of the business should drive the planning for IS development and deployment.

EARL'S MULTIPLE METHODOLOGY

Earl proposes that a firm's management has to tackle three important issues to succeed in the strategy formulation.

1. Clarification of the business needs and strategy in information systems terms

2. Evaluation of current information systems provision and use

3. Innovation of new strategic opportunities afforded by IT

EARL'S MULTIPLE METHODOLOGY

According to Earl, the process of developing a strategy has three activities led by different groups / people

1. Analytical activity – Led from TOP downwards

A participatory process (involves all staff) but driven by top management

The process should help clarify the 5Ws and 1H i.e.

Who are we? – Vision, Mission, Core Values

What – Identify overall business goals/purposes, resources needed, Critical success factors

Where?

When?

Why?

How?

NB: The deliverable is the overall business strategy

EARL'S MULTIPLE METHODOLOGY

ii. Evaluative activity – A bottom - up exercise

Staff should help evaluate business environment, both internal and external; in addition, identify what information resources are available; evaluate their value to business; their technical quality – this makes it possible to identify existing gaps e.g. skills, training required

The deliverable is an IT resource requirement definition

EARL'S MULTIPLE METHODOLOGY

iii. Creative activity – Inside – Out

Led by the IT experts in the organization or consultants in the area

Purpose of the activity: to marry the two deliverables (in (i) and (ii) above) – the overall business strategy and the IT resource requirement definition

They polish up the requirement definition (identify gaps and recommend solutions e.g. identifying new ways of using IT for competitive advantage
They provide advise on the available technology in the industry – and what can be useful to the firm

EARL'S MULTIPLE METHODOLOGY

Plan for the acquisition of resources through defining;

-Technical specifications plans
-Financial plans – budgets
-Time schedules – prioritizing systems and time frame for implementation

The deliverable of this activity is;
-A refined requirements definition
-Project plans

The overall deliverable is an IT/IS strategy (a summary of the 3 activities)

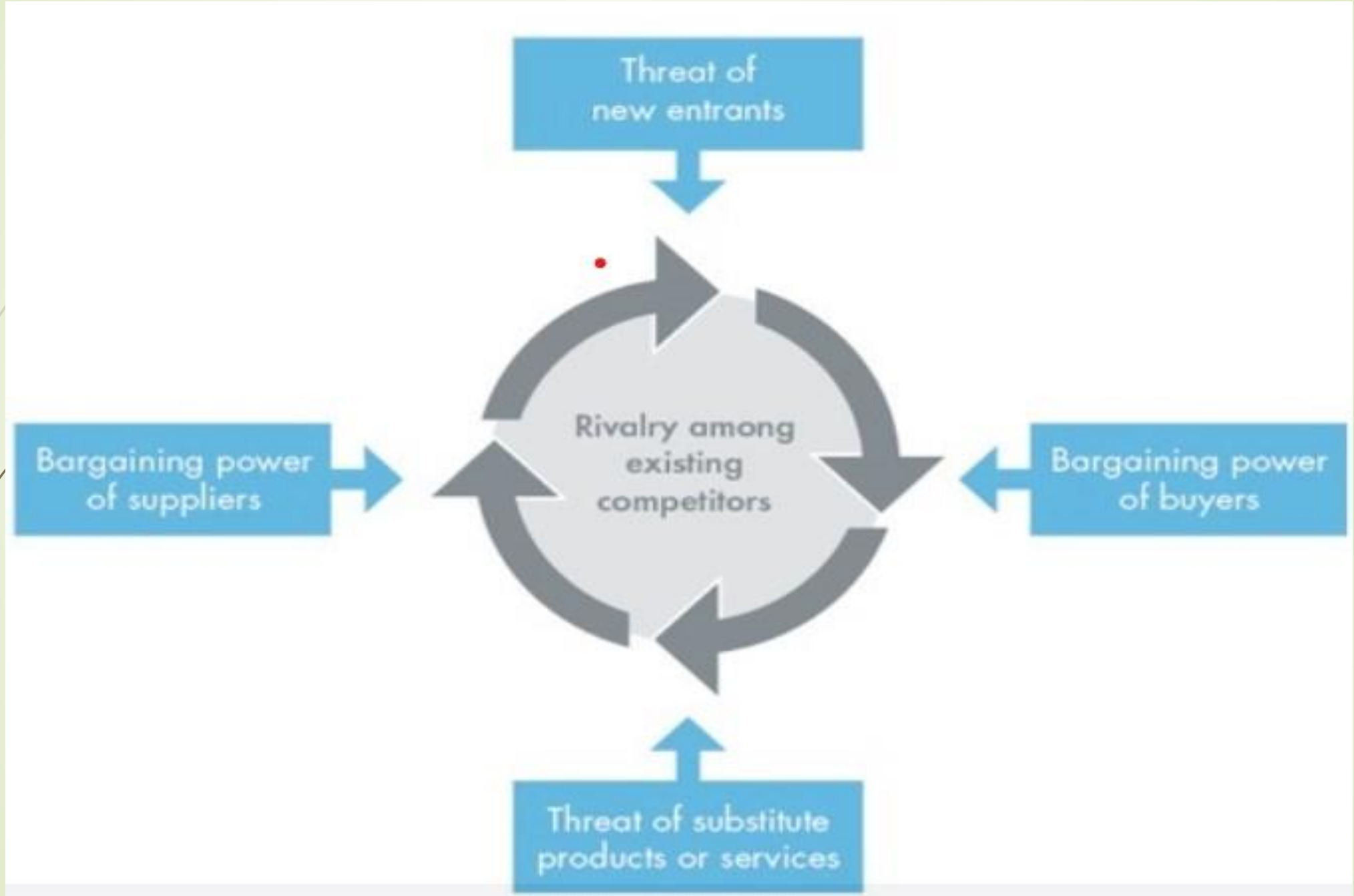
END

STRATEGIC USE OF MIS IN ORGANIZATIONS

Using Information Systems for Competitive Advantage

Michael Porter's Competitive forces model

- Provides general view of a firm, its competitors, and the environment


Threat of new entrants
Bargaining power of suppliers
Rivalry among existing competitors
Bargaining power of buyers
Threat of substitute products or services

According to Porter, the 5 forces that any organization planning to have an IT/IS strategy should consider are;

- Internal competition amongst industry players
- The threat of new entrants
- The bargaining power of customers
- The bargaining power of suppliers
- The threat of substitute products or services

When you understand the forces affecting your industry, you can adjust your strategy, boost your profitability, and stay ahead of the competition.

You can take fair advantage of a strong position or improve a weak one, and avoid taking wrong steps in the future.

- Industry competition – created amongst industry members

- Suppliers prefer to give less of their product or service for more of the firm's money

- Customers prefer more of the firm's services/goods for less of their money

- Potential entrants seek to lure a firm's customers (market share), they promise to give more for less of the customer's money

- Substitutes seek to replace a firm's services / products

IT/IS INTEGRATION

Supplier level: Systems should seek to identify the best supplier; understand the market well, know where our suppliers are sourcing our raw material and at how much

Customer level: Take control of the supplier links to be able to lower costs; then improve quality so as to afford to give discounts to customers or be able to justify the price (thru' quality products / services)

Potential entrants: Ensure you've information – details of who is planning to come in, what they have to offer, source of their technology etc

NB. By controlling suppliers and customers, you will already be giving MORE for LESS, so that entrants only come to compete and not to replace.

Substitutes: Porter advises on the need to give customers substitutes – use systems to identify customer needs and provide what fits them.

NB. Effective control of the 4 forces reduces challenges from internal competition.

From the above, Porter proposes 3 strategies;

Cost leadership – Get your production costs; produce with less costs; produce more to be everywhere (economies of scale), to supply whenever they need; don't compromise quality.

Product/Service differentiation -Differentiate from those of competitors in terms of Price, Packaging, and Customer satisfaction

Develop a niche' – put systems in place that will bring new ways of doing business; those convenient to customer e.g working from home; develop new products and services; focus on where you can excel

The hyper-competition model

Richard D'Aveni, professor of business strategy, believes the idea of sustained competitive advantage is dead

Business has entered a new era of hyper competition

A dramatic shift from slow-moving, stable business environments to one characterized by a quick-strike mentality on the part of firms aimed specifically at disrupting the competitive advantage of market leaders.

From ‘sustaining advantage’ to ‘disrupting the market’

"The old structure was: define an industry, reduce the level of competition and then avoid competition where possible,"

“Successful companies today are those disrupting markets and acting as if there are no boundaries to entry”.

Competitive advantage is no longer sustainable over the long term. Advantage, instead, is continually created, eroded, destroyed and recreated through strategic maneuvering.

Hyper competition is when **organizations use tactics to disrupt the competitive advantage held by industry leaders**

Characteristics of hyper competition

High level of rivalry among the players

Strategic maneuvers occur at a quick, intense and unexpected pace

Rapid technological and structural changes

Adoption of flexible strategies is common because the competitive landscape is changing rapidly

Information System Strategies for Dealing with Competitive Forces

Strengthening customer and supplier intimacy.

-Strong linkages to customers and suppliers increase switching costs and loyalty.
Toyota: uses IS to facilitate direct access from suppliers to production schedules
-Permits suppliers to decide how and when to ship supplies to plants, allowing more lead time in producing goods.
-Amazon: keeps track of user preferences for purchases, and recommends titles purchased by others

Low-cost leadership

Use information systems to achieve the lowest operational costs and the lowest prices. E.g. Walmart

- Inventory replenishment system sends orders to suppliers when purchase recorded at cash register.
- Minimizes inventory at warehouses, operating costs.
- Efficient customer response system

Product differentiation

Use information systems to enable new products and services, or greatly change the customer convenience in using your existing products and services. E.g., Google's continuous innovations, Apple's iPhone.

Use information systems to customize, personalize products to fit specifications of individual consumers. E.g., Nike's iD program for customized sneakers

Focus on market niche

Use information systems to enable specific market focus, and serve narrow target market better than competitors.

- Analyzes customer buying habits, preferences

- Advertising pitches to smaller and smaller target markets

E.g., Hilton Hotel's OnQ System Analyzes data collected on guests to determine preferences and guest's profitability

Note.

Some companies pursue several strategies at same time. Eg Walmart, Apple, Amazon

To them, successfully using IS to achieve competitive advantage requires precise coordination of technology, organizations, and people.

Information systems can improve overall performance of business units by promoting synergies and core competencies

Synergies: When output of some units used as inputs to others, or organizations pool markets and expertise. E.g. Purchase of YouTube by Google etc.

Core competencies: Activity for which firm is world-class leader. Relies on knowledge, experience, and sharing this across business units.

The Internet's impact on competitive advantage

1. Enables new products and services
2. Encourages substitute products
3. Lowers barrier to entry
4. Changes balance of power of customers and suppliers
5. Creates new opportunities for creating new markets, building brands, and large customer bases
6. Transforms some industries

Using Systems for Competitive Advantage: Management Issues

1. Sustaining competitive advantage: Because competitors can retaliate and copy strategic systems, competitive advantage is not always sustainable; systems may become tools for survival

2. Managing strategic transitions: Adopting strategic systems requires changes in business goals, relationships with customers and suppliers, and business processes

Group Discussion

Discuss ways the following **Organizations are using Information Systems for Competitive Advantage**

Group 1 – Amazon
Group 2 - Uber
Group 3 - Netflix
Group 4 - Safaricom

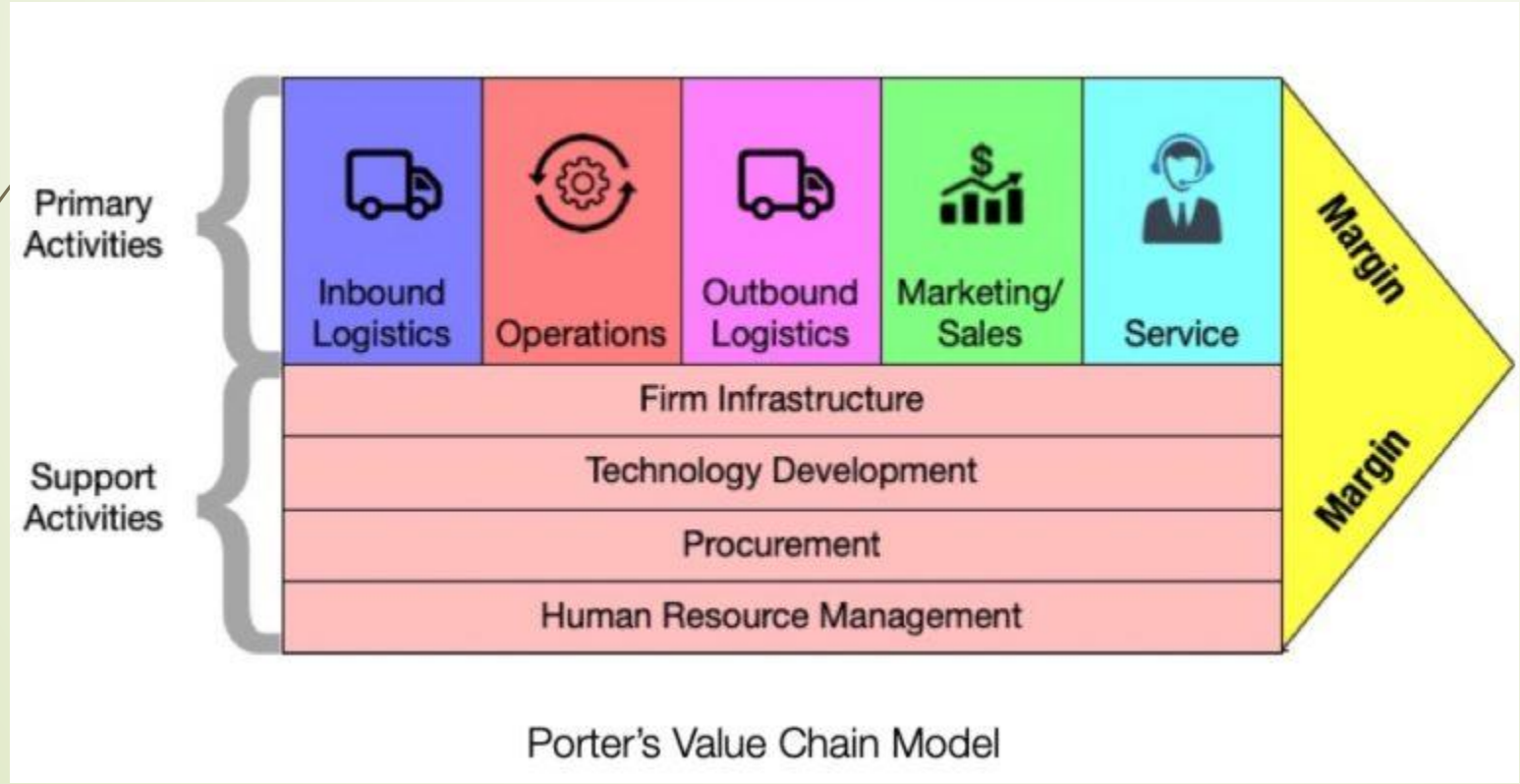
Value Chain Model

Michael Porter's value chain model is a framework that identifies the primary activities and support activities that are required to create value for customers.

The primary activities include inbound logistics, operations, outbound logistics, marketing and sales, and service, while the support activities include procurement, technology development, human resource management, and firm infrastructure.

Value Chain Model

By analyzing each of these activities and identifying how they can be streamlined or enhanced, a company can create a competitive advantage.



Porter's Value Chain Model

Group Assignment_3

Porter's Business value chain model

- Views firm as series of activities that add value to products or services,
- Highlights activities where competitive strategies can best be applied

Task

- Based on the model, determine areas information systems can be used strategically to create more value and enhance profit margin

15 Marks

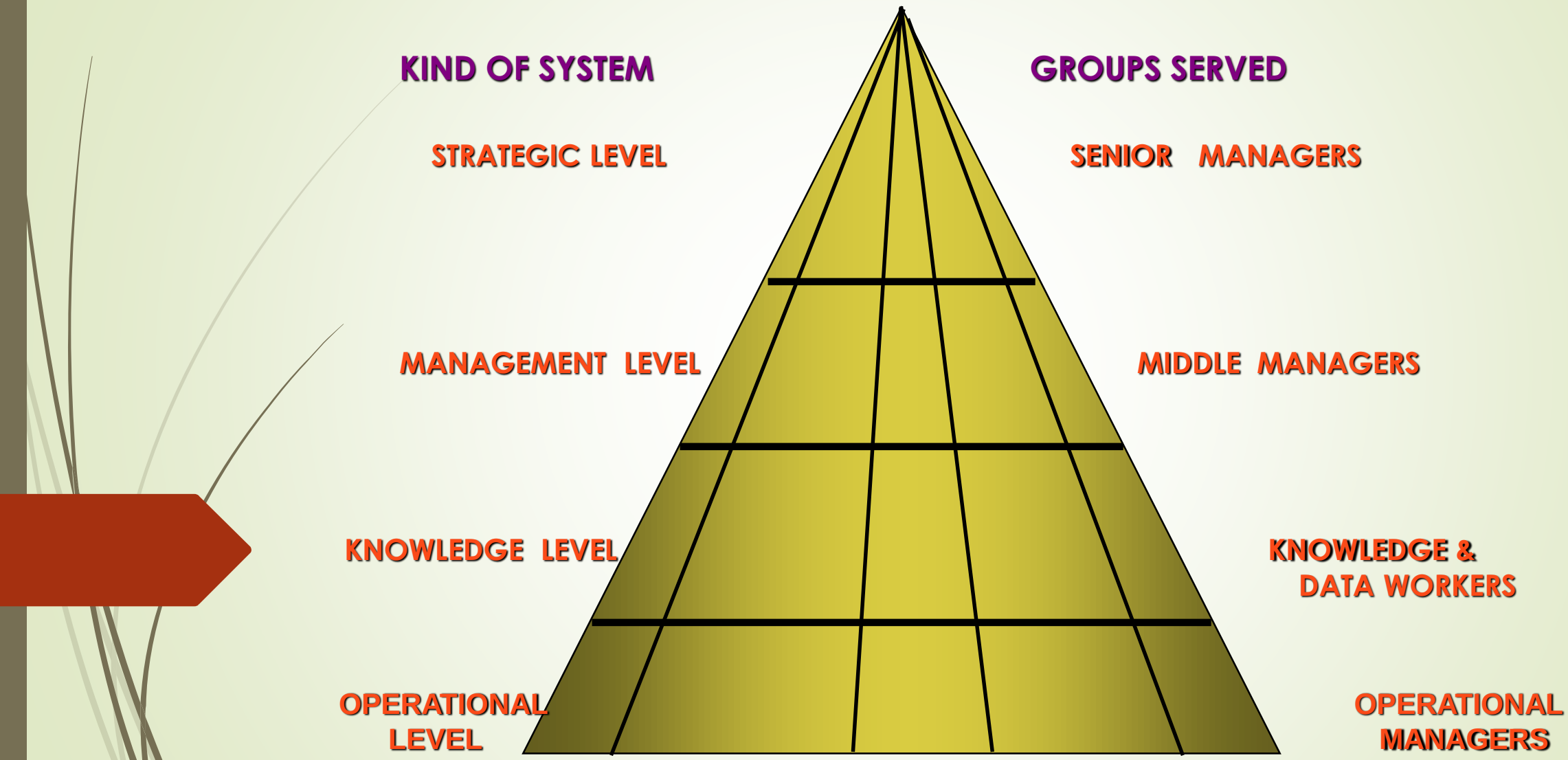
Lecture 3

MIS Subsystems

Management Information Systems (MIS) form the backbone of modern business operations, supporting various organizational functions through specialized subsystems.

These subsystems can be categorized based on *organizational levels* or *their functions*.

MIS subsystems on Management Levels



OPERATIONAL LEVEL

Transaction Processing System (TPS)

Purpose:
Handles routine, day-to-day business transactions.
Ensures data accuracy and reliability for operational processes.

Key Features:
Real-time or batch processing (e.g., point-of-sale systems, ATM transactions).

High volume, repetitive tasks (e.g., payroll processing, inventory updates).

Structured data input and output.

Ensures data integrity through validation and error-checking mechanisms.

Examples:
Credit card processing systems.
Online booking systems (e.g., airline reservations).

KNOWLEDGE LEVEL

Knowledge Management System (KMS)

Purpose:
Captures, stores, and shares organizational knowledge.

Enhances collaboration and innovation.

Key Features:
Document management systems (e.g., SharePoint).

Expertise locators (identifies in-house experts).

Collaboration tools (wikis, forums, intranets).

AI-driven knowledge retrieval (chatbots, recommendation engines).

Examples:
Company wikis (e.g., Confluence).
Customer support knowledge bases.

KNOWLEDGE LEVEL

Office Automation System (OAS)

Purpose:
Improves efficiency in office tasks through digital tools.

Supports communication, document handling, and workflow automation.

Key Features:
Word processing, spreadsheets, email, and scheduling tools.

Workflow automation (e.g., e-forms, approval systems).

Virtual collaboration (video conferencing, shared drives).

Examples:
Microsoft Office 365.
Google Workspace (Docs, Sheets, Meet).

MANAGERIAL LEVEL

Management Reporting System (MRS)

Purpose:
Provides structured reports to middle managers for tactical decision-making.

Summarizes transactional data from TPS into useful formats.

Key Features:
Predefined, periodic reports (daily, weekly, monthly).

Summarized and aggregated data (e.g., sales reports, budget summaries).

Supports monitoring and control rather than complex analysis.

Examples:
Sales performance dashboards.
Inventory status reports.

MANAGERIAL LEVEL

Decision Support System (DSS)

Purpose:
Assists managers in making semi-structured or unstructured decisions.

Uses analytical models and data visualization for problem-solving.

Key Features:
Interactive and user-friendly interfaces.

Incorporates external and internal data sources.

Uses "what-if" analysis, simulations, and forecasting.

Supports ad-hoc queries rather than fixed reports.

Examples:
Financial planning tools (e.g., investment analysis).
Supply chain optimization software.

EXECUTIVE LEVEL

Executive Information System (EIS)

Purpose:
Provides top executives with summarized, strategic-level information.

Focuses on high-level trends and key performance indicators (KPIs).

Key Features:
Drill-down capability (from summaries to detailed data).

Graphical dashboards with critical metrics.

Access to external data (market trends, competitor analysis).

Exception reporting (highlights deviations from expected results).

Examples:
Balanced scorecard systems.
Corporate performance monitoring tools.

Functional MIS subsystems

Financial Management Subsystem

Purpose:
Manages an organization's financial activities, including accounting, budgeting, and investment analysis.

Ensures compliance with financial regulations and supports strategic financial planning.

Key Features:
General ledger, accounts payable/receivable, and payroll processing.

Budgeting and forecasting tools for financial planning.

Financial reporting (balance sheets, income statements, cash flow statements).

Risk management and investment analysis (e.g., ROI, NPV calculations).

Integration with banking and tax systems.

Examples:
QuickBooks, Oracle Financials

Human Resource Management (HRM) Subsystem

Purpose:
Manages employee-related processes, including recruitment, payroll, performance evaluation, and training.

Enhances workforce productivity and ensures compliance with labor laws.

Key Features:
Recruitment and applicant tracking systems (ATS).

Payroll and benefits administration.

Performance management and appraisal systems.

Employee self-service portals (leave requests, tax forms).

Training and development tracking (Learning Management Systems - LMS).

Examples:
Workday, SAP SuccessFactors
BambooHR, Oracle HCM Cloud

Marketing Subsystem

Purpose:
Supports marketing activities such as customer analysis, campaign management, and sales forecasting.

Helps in understanding consumer behavior and improving brand engagement.

Key Features:
Customer Relationship Management (CRM) integration.

Market research and analytics tools (segmentation, trend analysis).

Digital marketing automation (email campaigns, social media management).

Sales forecasting and lead tracking.

Advertising and promotional campaign management.

Examples:
HubSpot, Salesforce Marketing Cloud
Google Analytics, Adobe Marketing Suite

Production/Operations Subsystem

Purpose:
Manages manufacturing and service operations, ensuring efficiency in production processes.

Optimizes resource utilization and minimizes operational costs.

Key Features:
Production planning and scheduling (ERP integration).

Inventory and quality control management.

Supply chain coordination (procurement, warehousing).

Machine and workforce productivity tracking.

Maintenance management (predictive and preventive).

Examples:
SAP PP (Production Planning), Oracle Manufacturing Cloud
MRP (Material Requirements Planning) systems

Sales and Distribution Subsystem

Purpose:
Manages sales processes, order fulfillment, and customer distribution channels.

Enhances customer service and tracks sales performance.

Key Features:
Order processing and invoicing systems.

Customer and dealer management.

Pricing and discount management.

Sales analytics and commission tracking.

Integration with e-commerce platforms.

Examples:
SAP SD (Sales and Distribution), Salesforce CRM

Zoho SalesIQ, Microsoft Dynamics 365 Sales

Logistics and Supply Chain Subsystem

Purpose:
Ensures efficient movement of goods from suppliers to customers.

Optimizes logistics, warehousing, and transportation management.

Key Features:
Inventory and warehouse management (WMS).

Transportation and fleet management.

Supplier and vendor relationship management (SRM).

Demand forecasting and procurement automation.

Real-time tracking (IoT, RFID, GPS).

Examples:
SAP SCM (Supply Chain Management), Oracle SCM Cloud
JDA Software, Manhattan Associates WMS

Each functional MIS subsystem plays a critical role in business operations:

Financial Management ensures fiscal control and planning.

HRM manages workforce efficiency.

Marketing drives customer engagement.

Production/Operations optimizes manufacturing.

Sales & Distribution handles order fulfillment.

Logistics & SCM streamlines supply chain processes.

Group Discussion

Task 1

a) Compare and contrast the following MIS subsystems

- TPS
- MRS
- DSS

Task 2

Discuss the features of an enterprise-wide MIS solution. Outline the specific benefits of such systems based on two examples of choice

Task 3

Discuss ways MIS solutions have impacted the following career professions

- Accounting and Finance
- Marketing
- Management

Lecture 2

MIS as a Business Solution

MIS as a Business Solution

Most business problems relate to Organization, Technology and People

MIS is a powerful business solution that transforms raw data into actionable insights, driving efficiency, innovation, and growth.

Organizations that effectively implement MIS gain a strategic edge in today's data-driven economy.

Using information systems effectively requires an understanding of the ***organization, people***, and ***information technology*** shaping the systems.

Organizational problems

Organizational problems can trigger or necessitate a review of existing information systems (IS) because they signal inefficiencies, risks, or misalignments that require corrective action

Examples

i) Outdated Business Processes

Legacy processes may no longer align with industry standards or technological advancements.

The current IS may enforce outdated workflows, creating bottlenecks.

Digital transformation initiatives (e.g., automation, AI integration) may require process updates.

Outcome: The review identifies gaps where the IS must be modernized to support new workflows.

ii). Unsupportive Culture and Attitudes

Low adoption rates or employee resistance may indicate poor system usability or misalignment with user needs.

A culture resistant to change may require a system redesign to improve engagement (e.g., user-friendly interfaces, better training).

Outcome: The review assesses cultural barriers and recommends changes to improve acceptance (e.g., change management strategies, UI improvements).

iii) Political In-Fighting

Competing departmental agendas may lead to conflicting system requirements.

Power struggles can result in biased system usage (e.g., data silos, underutilized features).

Outcome: The review helps standardize processes, improve transparency, and ensure the IS serves organizational (not just factional) goals.

iv). Turbulent Business Environment / Frequent Changes

Market shifts (e.g., new regulations, competitors) may render the current IS obsolete.

The system may lack scalability to adapt to rapid changes (e.g., cloud migration needs).

Outcome: The review evaluates flexibility gaps and recommends agile solutions (e.g. modular architectures, SaaS platforms).

v). Complexity of Task

Overly complex systems lead to errors, inefficiencies, and high training costs.

Tasks may require new functionalities (e.g., AI, analytics) not supported by the current IS.

Outcome: The review simplifies or re-engineers the system to reduce complexity (e.g., workflow automation, better integration).

vi. Inadequate Resources (Time, Budget, Expertise)

Underfunded or poorly maintained systems become security risks or performance liabilities.

Lack of skilled personnel may necessitate outsourcing or adopting more manageable solutions (e.g., low-code platforms).

Outcome: The review identifies cost-effective optimizations (e.g., cloud migration, third-party tools) to alleviate resource strain.

Technological challenges

Technological advancements and limitations often expose weaknesses in existing information systems (IS), necessitating a review to ensure efficiency, security, and competitiveness.

i. Insufficient or Aging Hardware

Slow performance, frequent crashes, or inability to run modern applications.

High maintenance costs and lack of vendor support for outdated hardware.

Security vulnerabilities due to outdated firmware/components.

Outcome of the review:
Identify hardware bottlenecks and plan upgrades (e.g., cloud migration, new servers).
Evaluate cost-benefit of replacing vs. maintaining aging infrastructure.

ii. Outdated Software

Unsupported software (e.g., expired licenses, end-of-life OS) poses security risks.

Incompatibility with newer applications or compliance requirements.

Missing features that competitors leverage (e.g., AI, automation).

Outcome of the review:
Assess software modernization needs (e.g., SaaS, ERP upgrades).
Plan phased migration to avoid business disruption.

iii. Inadequate Database Capacity

Slow query responses, data corruption, or inability to scale with business growth.

Compliance risks due to poor data management.

Need for real-time analytics but current DB lacks processing power.

Outcome of the review:
Recommend scaling up (bigger servers) or scaling out (NoSQL, cloud DBs).
Evaluate data archiving strategies or database optimization.

iv. Insufficient Telecommunications Capacity

Network congestion, slow remote access, or unreliable VoIP/video conferencing.

Increased remote work demands better bandwidth and security

Emerging tech (IoT, 5G) requires higher-speed, low-latency networks.

Outcome of the review:
Upgrade network infrastructure (fiber optics, Wi-Fi 6, cloud networking).
Assess cybersecurity risks with expanded connectivity.

v. Incompatibility of Old Systems with New Technology

Legacy systems cannot integrate with modern APIs, cloud services, or mobile apps.

Data silos prevent seamless workflows (e.g., CRM not syncing with ERP).

Vendor lock-in limits innovation.

Outcome of the review:
Decide between modernization (APIs, middleware) or replacement (cloud-native solutions).
Conduct a cost-benefit analysis of integration vs. migration.

vi. Rapid Technological Change

Competitors adopt AI, blockchain, or automation, leaving the business behind.

Current IS lacks agility to adapt to new tech trends.

Customer expectations evolve (e.g., mobile-first, omnichannel experiences).

Outcome of the review:
Identify which emerging technologies align with business goals.
Develop a technology roadmap for phased adoption (e.g., pilot AI chatbots before full deployment).

People-Related Challenges

These involve employees, leadership, and organizational culture e.g

i) Resistance to Change - Employees fear job loss or struggle with new systems.

ii) Skill Gaps & Training Needs - employees lack digital skills for modern tools.

iii)Remote & Hybrid Work Challenges - Difficulty in managing distributed teams.

Group Discussion

Discuss ways MIS solutions help address the following business challenges;

Room 1 – Organization related challenges

i) Inefficient business processes
ii) Poor decision making
iii) Slow adoption to market changes
iv) Poor collaboration

Room 2 – People related challenges

i) Resistance to change
ii) Skill gaps and training needs
iii) Remote and Hybrid work challenges

Room 3 – Technology related challenges

i) Outdated IT systems
ii) Data overload and poor data management
iii) System integration issues
iv) Cyber security threats and data breaches

Introduction to Management Information System

Introduction

A Management Information System (MIS) is an organized system that

collects, processes, stores, and *disseminates* information to support

managerial *decision-making, coordination, control, analysis,* and *visualization* in an organization.

MIS combines information technology, people, and business processes to help organizations achieve their objectives.

Strategic IS

An IS that helps achieve **long-term** competitive advantage

SIS embodies two types of ideas:

- Potentially-winning business move
- How to harness ICT to implement that move

Key Components of MIS

Hardware: Physical devices like computers, servers, and networking equipment
Software: Applications and programs that process data
Data: Raw facts and figures that are processed into meaningful information
Procedures: Rules and guidelines for using the MIS
People: Users, managers, and IT professionals who interact with the system

User perspective of MIS

The **user perspective** of MIS varies widely—from executives needing strategic insights to frontline staff requiring quick transaction tools.

A well-designed MIS must:
Cater to different user needs
Ensure ease of use, accuracy, and security
Continuously evolve based on feedback

By focusing on the end-user experience, organizations can maximize MIS adoption and ROI.

Types of MIS Users

A. Top-Level Management (Strategic Users)
Users: CEOs, Directors, Senior Executives

Needs:
High-level **strategic insights** (market trends, financial forecasts)
Summarized reports (KPIs, performance dashboards)
Predictive analytics for long-term planning

Example Tools:
Executive Information Systems (EIS)
Business Intelligence (BI) dashboards

B. Middle-Level Management (Tactical Users)

Users: Department Heads, Managers

Needs:
Department-specific performance data (sales, HR, operations)
Comparative analysis (budget vs. actuals)
Decision-support tools for policy implementation

Example Tools:
Decision Support Systems (DSS)
ERP modules (e.g., SAP, Oracle)

C. Operational-Level Employees (Day-to-Day Users)

Users: Supervisors, Clerks, Frontline Staff

Needs:
Transaction processing (inventory updates, payroll entries)
Real-time operational data (order status, customer records)
User-friendly interfaces for quick data entry

Example Tools:
Transaction Processing Systems (TPS)
CRM software (e.g., Salesforce, Zoho)

D. Knowledge Workers (Analysts & Specialists)

Users: Data Scientists, IT Staff, Consultants

Needs:
Raw data access for deep analysis
Custom reporting & modeling tools
Integration with AI tools

Example Tools:
Advanced analytics platforms (e.g., Python, SQL)
Data Warehousing solutions

E. External Users (Customers, Suppliers, Regulators)

Users: Clients, Vendors, Government Agencies

Needs:
Self-service portals (order tracking, compliance reporting)
Secure data exchange (e-procurement, e-filing)

Example Tools:
B2B portals, Blockchain-based systems

Key User Expectations from MIS

Users evaluate MIS based on:

Ease of Use (Usability)
Intuitive interfaces (drag-and-drop dashboards)
Minimal training requirements

Relevance of Information
Role-specific data (e.g., sales team needs customer insights, not HR data)
Customizable reports

Timeliness & Accuracy
Real-time or near-real-time updates
Error-free data processing

Accessibility & Mobility
Cloud-based access from any device
Mobile-friendly designs

Security & Privacy
Role-based access controls

Common User Challenges with MIS

User Group	Common Challenges
Executives	Information overload, complex dashboards
Managers	Delayed reports, lack of cross-department integration
Operational Staff	Cumbersome data entry, system downtime
Knowledge Workers	Data silos, poor API integrations
External Users	Login issues, slow response times

MIS User perspective

When firms cannot achieve business objectives, these objectives become business challenges that form the basis for new solutions.

An MIS thus is an organizational and management solution, based on information technology, to a challenge posed by the environment (Market place challenges).

MIS as a Business Solution

Most organizational problems stem from **inefficiencies in organization, people, or technology**—and often, a combination of all three.

Technology-based solutions (like **ERP**, **AI**, **cloud computing**, **and collaboration tools**) help bridge these gaps by:

Optimizing processes (Organization)
Empowering employees (People)
Modernizing infrastructure (Technology)

Business drivers of Information Systems
Group discussion

TASK 1 :
Describe today's Market place / Business environment (from an organization of choice) in terms of;

i) Competition / Business rivalry

ii) Ways competitors are using ISs to manage market-place challenges

Business drivers of Information Systems

Group discussion

TASK 2 :

Ways
i) organizational
ii) Technological and
iii) People

inefficiencies in organizations can trigger review of existing information system solutions